

## REMARKS/ARGUMENTS

Claims 1-10, 12-28, 30-31, 33-34, 37, and 39-43 were previously pending in the application. Claim 2 is canceled; claims 1, 22, 24, 28, 30, and 43 are amended; and new claim 44 is added herein. Assuming the entry of this amendment, claims 1, 3-10, 12-28, 30-31, 33-34, 37, and 39-44 are now pending in the application. The Applicant hereby requests further examination and reconsideration of the application in view of the foregoing amendments and these remarks.

In paragraph 3 of the office action, the Examiner rejected claims 1-2, 4, 9-10, 12-13, 19-20, 22, 24, 28, and 30-31 under 35 U.S.C. 103(a) as being unpatentable over Brandstein. In paragraph 5, the Examiner objected to claims 3, 5-8, 13-18, 21, 26-27, and 33-34 as being dependent upon a rejected base claim, but indicated that those claims would be allowable if rewritten in independent form. In paragraph 8, the Examiner allowed claims 37 and 41-42. For the following reasons, the Applicant submits that all of the now-pending claims are allowable over Brandstein.

### Ambiguities in the Office Action

In the Office Action Summary (PTOL-326 form), the Examiner indicated that claims 13 and 25 were both rejected and objected to. In addition, in paragraph 3, the Examiner rejected claim 13, but also stated that claim 13 was objected to in paragraph 5. On the other hand, claim 25 is not mentioned at all in the text of the office action.

Similarly, although claims 39-40 and 43 are indicated as being pending in the application, they are not otherwise mentioned in the Office Action Summary. Nor are they mentioned at the beginning of paragraph 3, although they are addressed later on in paragraph 3.

Clarification of these ambiguities is requested by the Applicant.

### Claims 1, 22, 24, 28, 30, and 43

Brandstein teaches an adaptive beamforming technique that involves filtering by (a) delaying and scaling signals from different microphones and (b) summing the resulting processed signals to generate a beam signal.

Referring, for example, to Brandstein's Fig. 1, except for reference signal 25, which is delayed by storage element 40, each signal from a different microphone 16 is delayed by a corresponding alignment channel 26. In addition, each delayed signal, including the delayed reference signal 25, is scaled by a corresponding weighting element 32 to generate a scaled, delayed signal corresponding to each different microphone 16. The resulting plurality of scaled, delayed signals corresponding to the plurality of microphones 16 are summed by summation element 34 to generate a beam signal 66.

In rejecting claim 1, the Examiner stated that Brandstein discloses "filters (20) for filtering signals for microphones (16) – a sensor array, which reads on filtering; adds (74) with the signal processor (78) and summing element (34) for providing a beamed output signal, which reads on combining the processed audio signals in a nonlinear manner," citing Fig. 3; column 10, lines 50-53; column 11, lines 55-63; and column 12, lines 31-57.

Referring to Brandstein's Fig. 3, the Examiner apparently interpreted previously pending claim 1, such that window filters 20 provides an example of the filtering step of claim 1 and the elements to the

right of window filters 20 in Fig. 3 provide an example of the combining step of claim 1. The Applicant has amended claim 1 to exclude this particular interpretation of the claimed invention.

In particular, the filtering step has been amended to explicitly recite that the filtering step involves "filtering by delaying and scaling the audio signal from at least one microphone." In addition, the combining step has been amended to explicitly recite that the combining step involves "combining the processed audio signals for the two or more microphones in a nonlinear manner ... to form an acoustic beam."

These amendments make the Examiner's previous interpretation of claim 1 improper when applied to currently amended claim 1. Because the filtering step of currently amended claim 1 involves delaying and scaling, the analogous filtering by delaying and scaling in Brandstein includes (i) the delaying by storage element 40 and alignment channels 26 and (ii) the scaling by weighting elements 32, while the function of summation element 34 of Brandstein is analogous to (but different from) the combining step of currently amended claim 1.

As such, the combining step of currently amended claim 1 cannot be properly interpreted to include Brandstein's adders 74, which are part of alignment channels 26, which perform the delaying of corresponding signals. The only proper analogue taught in Brandstein for the combining step of currently amended claim 1 is summation element 34.

Significantly, the only type of combining that Brandstein teaches for summation element 34 is pure summation, which is a linear combining process. See, e.g., Fig. 2, which depicts element 34 with the summation symbol  $\Sigma$ ; column 4, lines 36-38; column 9, lines 13-17 and 54-57; column 10, lines 39-43; and column 11, lines 57-60. There is no teaching or even suggestion anywhere in Brandstein for any process implemented by summation element 34 other than summing, let alone anything other than a linear combining process. Note that weighted summation and weighted averaging are also linear combining processes.

Furthermore, previously presented claim 1 explicitly recited that "the nonlinear signal estimation processing picks a representative, central value from the processed audio signals, by altering at least one extreme value from at least one of the processed audio signals." (emphasis added) In rejecting previously pending claim 1, the Examiner completely ignored this explicit claim recitation. The Applicant finds this especially frustrating because this was exactly the feature from original (and previously canceled) claim 11 that the Examiner previously indicated as being allowable and which the Applicant previously added to claim 1 to place it into condition for allowance. Not only did the Examiner reject, in the present office action, subject matter that she had previously indicated as being allowable, but she completely failed to address the specific feature that, according to the Examiner, provided that allowability.

In fact, the Examiner's failure to consider this explicitly recited feature of claim 1 is significant, because Brandstein does not teach or even suggest such a feature.

For all these reasons, the Applicant submits that currently amended claim 1 is allowable over Brandstein. For at least some of these reasons, the Applicant submits that currently amended claims 22, 24, 28, 30, and 43 are allowable over Brandstein. Since claims 3-10, 12-21, 25-27, 31, 33-34, and 39-40 depend variously from claims 1, 24, 28, and 30, it is further submitted that those claims are also allowable over Brandstein. The Applicant submits therefore that the rejections of claims under Section 103(a) have been overcome.


New Claim 44

New claim 44 is equivalent to previously pending claim 3 rewritten in independent form. Since the Examiner stated that previously pending claim 3 would be allowable if rewritten in independent form, the Applicant submits that new claim 44 is allowable.

In view of the above amendments and remarks, the Applicant believes that the now-pending claims are in condition for allowance. Therefore, the Applicant believes that the entire application is now in condition for allowance, and early and favorable action is respectfully solicited.

Respectfully submitted,

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